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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/592,982	01/18/2008	Orhan Ustun	0115-062616	9911
28289 7590 03/02/2011 THE WEBB LAW FIRM, P.C. 700 KOPPERS BUILDING 436 SEVENTH AVENUE PITTSBURGH, PA 15219				
EXAMINER KAMPS, FRANCES H				
ART UNIT		PAPER NUMBER		
3749				
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03/02/2011		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/592,982

Applicant(s)

USTUN, ORHAN

Examiner

FRANCES KAMPS

Art Unit

3749

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 January 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9 and 15-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9 and 15-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-940)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed January 3, 2011 have been fully considered but they are not persuasive.

2. **In response to Applicant argument:**

The Examiner asserts that it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Takeuchi, as taught by Helmut. Applicant respectfully disagrees at least on the basis of the function of the spiral-shaped heat-conducting element. Specifically, the spiral-shaped heat conducting element (a) has the effect of improving the heat transfer from the outer absorber to the (sole) inner fluid room; and (b) holds the entire device based on the central metal piping.

3. **Examiner respectfully responds:**

According to Applicant's characterization of the function of the spiral heat conducting element of Helmut, the claim limitation of "*wherein the vacuum tube is resiliently connected to the distributor frame via the prestressed heat conducting elements*" is inherently present within the proposed combination. Particularly, if the spiral-shaped heat conducting element *holds the entire device based on the central metal piping*, as alleged by Applicant, and the spiral-shaped heat conducting element is a resilient member, as disclosed by Helmut (page 2, paragraph 5) then it follows that *the vacuum tube is resiliently connected to the distributor frame via the prestressed heat conducting elements*.

Additionally, Applicant asserts that *it is known for someone skilled in the art that the pipes (shown on the right hand side of FIG. 1 of the Takeuchi patent, below) are attached to a frame*. Examiner agrees with this assertion and points out that this further bolsters the above position that the feature in question will naturally result from the proposed combination.

4. **In response to Applicant argument:**

In contrast, the Helmut apparatus fails to provide this feature [a resilient connection of the glass tube to a frame] as there is the rigid body 5 holding the outer glass tubes as well as the inner metal tube. ... This provides for no "play" if the pipes are contacted too roughly, for example, such as via hailstones, thereby resulting in breakage of the tubes. Thus, the objective of the present invention is not met by the Examiner's suggested structural combination.

5. **Examiner respectfully responds:**

Examiner respectfully disagrees. The Helmut reference discloses that the glass tubes are connected not directly to the body 5, but rather, they are connected to the body 5 via seals 4. It is apparent that these are elastomeric seals and that they are indeed resilient. Accordingly, it is reasonable to assume that Helmut did consider the need for *play* in the system – *the objective of the present invention*.

Furthermore, this argument is moot because Helmut was not relied upon for introducing a structural element like that of its body 5 into the proposed combination. Rather, as Applicant points out, it is apparent from Takeuchi that the pipes are attached to a frame and, in that manner, the entire device is held.

Claim Rejections – 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. **Claim 9 and 15 – 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

8. **In re claim 9:**

- The limitation, "*distributor frame*" is unclear. Specifically, it seems that "*frame*" may not be the appropriate term by which to label the feature it represents. For purposes of examination, this limitation will be interpreted as a *manifold*.

- The limitation "*wherein the vacuum tube is resiliently connected to the distributor frame*" is unclear. Specifically, as best understood by Examiner, the vacuum tube (3/6) is not connected to the distributor frame (11). Rather, it is connected to the central tubes (7/8) which are, in turn, connected to the distributor frame. For purposes of examination, it should be noted that the term "*connected*" is being understood as indirectly connected.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. §103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. **Claims 9 and 15 – 18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Takeuchi et al (US 4,440,156) in view of Helmut et al (DE 198 59 658 A1) in view of Ghela (US 6,619,283).**

11. **In re Claim 9**, Takeuchi et al ('156) discloses a solar collector (figs 1, 3), comprising a distributor frame (apparent / well known. See above; *Response to Arguments*) and a plurality of heat exchangers, wherein each the heat exchanger comprising:

- a vacuum tube (1 / 2; col 2, ln 26) having an inner wall (2), wherein the vacuum tube is a glass tube (col 2, lns 12 – 14);
- a fluid-conducting pipe system (4) adapted to hold a fluid (col 2, lns 28-29), wherein the fluid-conducting pipe system comprises an outer wall (inherent) connected to the distributor frame;
- at least one heat-conducting element (7, 8) made of metal ("thin metal plate"; col 2, ln 38) connecting the inner wall of the vacuum tube (2) to a the outer wall of the fluid-conducting pipe system (4) (col 3, lns 20 – 23); and
- means for collecting and concentrating solar energy ("solar heat-absorbing film" (3)) provided on a side of the inner wall of the vacuum tube (col 2, lns 18 – 20) facing away from the at least one

heat-conducting element (7, 8), wherein the outer wall of the fluid conducting pipe system is a metal wall ("metal pipe... preferably...copper"; col 2, lns 27, 28);

- wherein the heat-conducting element is contacting the outer wall of the fluid-conducting pipe system (fig 3) and prestressed (col 2, lns 56 – 58; "*biased*") against the inner wall of the vacuum tube and the fluid-conducting pipe system,
- wherein the vacuum tube is resiliently connected to the distributor frame via the prestressed heat conducting elements (best seen in fig 3). (The vacuum tube is connected to the pipe (4) (which would then be connected to a distributor frame) via the prestressed heat conducting elements 7/8).

12. Takeuchi et al ('156) lacks:

- a plurality of heat exchangers; and
- wherein:
 - each heat-conducting element
 - extends in a spiral shape along a cross- section of the heat exchanger, covers an angle of at least 450 degrees,
 - is attached at the outer wall of the fluid-conducting pipe system, and
 - the outer wall of the fluid-conducting pipe system is centered concentric to the inner wall of the vacuum tube.

13. Helmut et al ('658) teaches a solar collector comprising a plurality (pg 3, paragraph 6) of heat exchangers (figs 1, 2a (1)) having a vacuum tube (2) wherein:

- an outer wall of a fluid-conducting pipe (13) system is centered concentric to the inner wall of the vacuum tube (2), employing a counterflow heat exchange flow configuration, and
- each heat-conducting element (3) extends in a spiral shape along a cross- section of the heat exchanger covers an angle of at least 450 degrees (as apparent in fig 2a),

14. Additionally, such solar collectors having a plurality of heat exchanging units are well known (an array).

15. It would have been obvious to one having ordinary skill in the art at the time the invention was made modify the system of Takeuchi et al ('156), as taught by Helmut et al ('658), such that there are a plurality of heat exchangers and such that the fluid conducting pipe system is constructed as a concentric counterflow system in lieu of a single pass "U-tube" system to increase heat exchange surface area and thereby increase system efficiency.

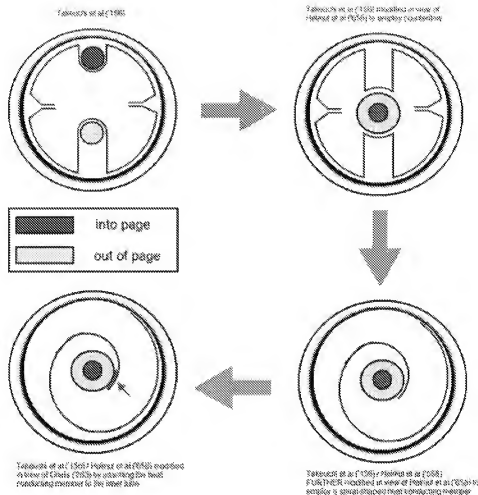
16. Such a combination would yield *wherein the vacuum tube is resiliently connected to the distributor frame via the prestressed heat conducting elements* (See above; *Response to Arguments*).

17. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Takeuchi et al ('156), as taught by Helmut et al ('658) such that each heat-conducting element extends in a spiral shape along a cross-section, covering an angle of at least 450 degrees, in the system of Takeuchi et al ('156) in the system of in order to maximize the thermal output of a solar collector, for the purpose of increased efficiency.

18. Ghela ('283) teaches a solar collector pipe (70) wherein a heat-conducting element (72) is attached at the outer wall of a fluid-conducting pipe (71) system (col 11, lns 39 - 46).

19. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Takeuchi et al ('156), as taught by Ghela ('283), such that heat is more readily transferred from the heat conducting elements to the fluid-conducting pipe system (col 11, lns 45, 46), thereby improving system efficiency.

20. The resultant combination of Takeuchi et al ('156) as taught by Helmut et al ('658) and Ghela ('283) would be as follows:



21. **Claims 1 – 8 and 10 – 14 have been cancelled by Applicant.**

22. **In re Claim 15**, the heat exchanger of Takeuchi et al ('156) / Helmut et al ('658) / Ghela ('283) had been discussed, wherein the modified heat exchanger utilizes a single heat conducting element (Helmut et al ('658) fig 2a; (3)) over an angular range between 350 to 359 degrees or between 90 and 179 degrees. However, the heat exchanger of Takeuchi et al ('156) discloses the use of two heat conducting elements (7, 8) spaced apart from one another in an angular arrangement on an outer wall of a fluid-conducting pipe system.

23. It would have been obvious to one having ordinary skill in the art to use the teaching of Takeuchi et al ('156) such that two heat conducting elements are utilized, doubling the collection area of the single heat conducting element of Helmut et al ('658) fig 2a; (3)), spaced apart from one another in an angular

arrangement on an outer wall of the fluid-conducting pipe system over an angular range between 350 to 359 degrees or between 90 and 179 degrees, to optimally cover the entire internal circumference of the inner wall of the vacuum tube to in order to maximize the thermal output of a solar collector, for the purpose of increased efficiency.

24. Please also note that Helmut et al ('658) additionally teaches three heat-conducting elements (fig 2c; (3)), wherein three of the heat-conducting elements are spaced apart from one another in an angular arrangement on an outer wall of the fluid-conducting pipe system over an angular range that encompasses / covers the entire internal circumference of the inner wall of the vacuum tube, as further evidence that the mere duplication of the essential working parts of a device involves only routine skill in the art.

25. **In re Claim 16**, the heat exchanger of Takeuchi et al ('156) / Helmut et al ('658) / Ghela ('283) had been discussed, wherein Helmut et al ('658) teaches a fluid-conducting pipe system comprises an outer volume (6) and an inner volume (7) ("co-axial"; page 2, fourth paragraph) operable in a counter-current mode (fig 7).

26. **In re Claim 17**, the heat exchanger of Takeuchi et al ('156) / Helmut et al ('658) / Ghela ('283) had been discussed, wherein Takeuchi et al ('156) discloses the fluid is a heat-conducting fluid (col 3, Ins 6, 7), and the fluid is contained within the inner tube (7, 8).

27. **In re Claim 18** the heat exchanger of Takeuchi et al ('156) / Helmut et al ('658) / Ghela ('283) has been discussed (see above in Claim 9), wherein Ghela ('283) teaches the at least one heat-conducting element is attached at the outer wall of a fluid-conducting pipe (71) system ("through a common extrusion process or... in direct contact" col 11, Ins 39 - 46). Hard-soldering a heat-conducting element at the outer wall of the fluid-conducting pipe system is merely another example of making two components into an integral piece. It would have been obvious to one having ordinary skill in the art at the time the invention was made to hard-solder a heat-conducting element to an outer wall of a fluid-conducting pipe, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art.

Conclusion

28. Any inquiry concerning this communication or earlier communications from the examiner should be directed to FRANCES KAMPS whose telephone number is 571.270.5726. The examiner can normally be reached on M-F; 8-5.

29. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve McAllister can be reached on 571.272.6785. The fax phone number for the organization where this application or proceeding is assigned is 571.273.8300.

30. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866.217.9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800.786.9199 (IN USA OR CANADA) or 571.272.1000.

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